Chapter 14

Behavioral Parameters

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This chapter describes how we obtained the initial estimates for the Global Trade Analysis Project (GTAP) behavioral parameters file. These include the source substitution or *Armington* elasticities, the factor substitution elasticities, the factor transformation elasticities, the investment parameters, and the consumer demand elasticities. Table 14.1 summarizes for these parameters: the associated notation, the set over which they are indexed, and their description. In this chapter we explain the role of each parameter in the GTAP Model, and describe how we obtained the current settings.

Most of the parameters treated here enter directly into the GTAP Data Base. In contrast with the rest of the data file where an extensive and elaborate process of transformation is required to remove any inconsistencies, and repair the omissions in the initial data sets, no such processing is required here for most of the behavioral parameters. For the most part, each individual parameter is an independent datum, which stands or falls on its own, and does not require any consistency checks with other parameters. The one exception to this rule is the consumer demand parameters (see section 14.5). Here we do need to check for consistency conditions — the triad of Engel aggregation, Cournot aggregation and symmetry condition. Also, there is a need to transform the data, from elasticities, for which we find empirical estimates, to the invariant parameters needed for our preferred functional form for the consumer demand system. Elasticities and parameters described in sections 14.1, 14.2, 14.3 and 14.4 have not been changed since the release of GTAP 6 Data Base, while the consumer demand parameters have been updated in this version.

14.1 Source Substitution Elasticities

The GTAP Data Base contains two sets of source substitution elasticities. One relates to the substitution between domestic products and imports, and the other to the substitution between imports from different regions. To define these parameters precisely, we need to refer to the theoretical structure of the GTAP Model. In that model, the source substitution elasticities are defined separately for each of the representative agents within each region rather than referring to a single economy-wide demand behavior, as in the other models. This means that for each commodity within each region, the domestic-import mix is determined separately for each industry, and for each of the final demand categories, namely investment, household consumption, and government consumption. The sourcing of imports is also determined separately for intermediate usage (for all industries together) and for each of the final demand category. Finally, for cross-regional behavior, the GTAP Model assumes that for each commodity, all agents in all regions display the same substitution elasticity.

Table 14.1 Behavioral Parameters in the GTAP Model

	Parameters	Set Index	Description
σ_D	ESUBD(i)	i∈ TRAD_COMM	Elasticity of substitution between domestic and imported goods in the Armington aggregation structure for all agents in all regions
σ_M	ESUBM(i)	i∈ TRAD_COMM	Elasticity of substitution among imports from different destinations in the Armington aggregation structure of all agents in all regions
σ_{VA}	ESUBVA(j)	j∈ PROD_COMM	Elasticity of substitution between primary factors in the production of commodity j
	ESUBT(j)	j∈ PROD_COMM	Elasticity of substitution between composite intermediate inputs and value-added in the production of commodity j
σ_T	ETRAE(i)	i∈ ENDWS_COMM	Elasticity of transformation for sluggish primary factor endowments.
	SLUG		Sluggish-mobile switch parameter
	RORFLEX(r)	r∈ REG	Flexibility of expected net rate of return of capital stock in region r, with respect to investment
	RORDELTA		Binary switch coefficient which determines the mechanism of allocating investment funds across regions.
β	SUBPAR(i,r)	i∈ TRAD_COMM r∈ REG	The substitution parameter in the CDE minimum expenditure function
γ	INCPAR(i,r)	i∈ TRAD_COMM r∈ REG	The expansion parameter in the CDE minimum expenditure function

The source substitution elasticities used in previous versions of the GTAP Data Base were taken from the SALTER model (Jomini *et al.* 1991). The SALTER settings are based on a synthesis of estimates from the econometric literature and original econometric work for one country – New Zealand. Since GTAP Data Base 6, we incorporate source substitution elasticities obtained from econometric work done by Hertel, Hummels, Ivanic and Keeney (2004). The authors estimated the elasticity of substitution among imports from different sources using the approach used by Hummels (1999), who identifies σ_i by exploiting cross-sectional variation in delivered prices.

The estimates of the elasticities of substitution among imports from different sources, $\sigma_{M,}$ obtained by Hertel, Hummels, Ivanic, and Keeney (2004) are given in the second column of elasticities reported in table 14.2. Compared to the trade elasticities used in previous versions of the GTAP Data Base, the simple average of the new trade elasticities, 7.0, is fairly similar to the previous average trade elasticity of 5.3. However, there is much greater sectoral variation in the econometrically estimated elasticities.

The substitution elasticities between domestic and imported commodities, $\sigma_{D,}$ also reported in Table 14.2, are linked to the $\sigma_{M,}$ by the "rule of two", i.e. $\sigma_M = 2\ \sigma_D$. This rule was first proposed by Jomini *et al.* (1991) and was retained on the GTAP parameters file. This rule was recently tested by Liu, Arndt, and Hertel (2002) in a back-casting exercise with a simplified version of the GTAP Model. While those authors reject the validity of the GTAP trade elasticities, they fail to reject the rule of two, thereby lending additional support to this approach.

14.2 Factor Substitution Elasticities

The nested CES production functions in the GTAP Model are similar to those used in many other applied general equilibrium models. Primary factors of production are assumed to substitute for one another according to the constant elasticity of substitution, σ_{VA}, while composite value-added and intermediates are used in fixed proportions. The overall elasticity of substitution among primary factors determines the ability of the economy to alter its output mix in response to changes in relative prices, or changes in the endowments of these factors. These parameters also play an important role in determining the sectoral supply response in the presence of sector-specific and sluggish factors of production. For example, with the supply of agricultural land being fixed in the model, the ability to expand farm output can be directly linked to the ease of substitution between land and labor, and land and capital.

The third column of table 14.2 reports the assumed values for σ_{VA} for each of the GTAP sectors. Like the trade elasticities, these are taken from the SALTER parameter file (Jomini *et al.* 1991). They are based on a review of the international cross-section studies which estimated this parameter, for various industries, using data from a wide range of countries. Note the relatively small elasticity of substitution in primary production. In light of the discussion regarding the linkage between this parameter and the sectoral supply response in the face of sector-specific factors, we can infer that whenever sector-specific, or sluggish factors of production are present in these sectors, this will significantly constrain the supply response of the sectors. Finally, we note that the greatest degree of substitutability (1.68) arises in the trade and transport sectors.

Although composite value-added and composite intermediate inputs are used in fixed proportions in the standard GTAP Model, a parameter specifying the elasticity of substitution (ESUBT) between composite intermediates and composite value-added has recently been introduced into the model. This modification allows the user to specify the elasticity of substitution at the top nest of the production structure. The default setting of the elasticity is zero for all commodities, hence the ratio of composite intermediate inputs and value-added used in production is fixed.

14.3 Factor Transformation Elasticities

The third class of behavioral parameters in GTAP describes the degree of primary factor mobility between the sectors. Within each region, the model distinguishes between primary factors that are perfectly mobile across productive sectors and those that are sluggish. In an experiment with sluggish factor endowments, it is important to find out *how much of a disparity in relative sectoral returns can be sustained over the simulation period.* This result is governed by the value of the elasticity of transformation, $\sigma_T < 0$. If σ_T is close to zero, then the allocation of factors across sectors is nearly fixed, and therefore factor supply is unresponsive to changes in relative returns. As σ_T takes on larger negative values, then the supply of factors will become more and more responsive to relative returns [see equation (51) in table 2.14 of chapter 2 in Hertel and Tsigas (1997)]. In the limit, as $\sigma_T \rightarrow -\infty$, this factor is perfectly mobile and no differential return can be sustained over the time horizon envisioned in the simulation. In this case, the factor should be reclassified as a perfectly mobile factor.

In the default setting which is generated from a standard aggregation of the data base, all labor types and capital are treated as perfectly mobile, whereas natural resources and agricultural land are treated as sluggish factors of production. Since agricultural land is used only in primary agricultural activities, the sluggishness of land is relevant only if the aggregation in question contains more than one farm sector.

The binary parameter SLUG allows users to change the default setting and switch the specification of an endowment from sluggish to mobile by choosing a value of zero for mobile or one for sluggish in the parameter file.

14.4 Investment Flexibility Parameters

Investment flexibility parameters refer to the degree of flexibility of regional investment. In the GTAP Model, if the user chooses to allow the allocation of global investment to regional economies to be responsive to region-specific rates of return on capital (parameter *RORDELTA* is 1), then the parameter *RORFLEX*(*r*) > 0 must be properly specified [equation (58) of table 2.15 in chapter 2 of Hertel and Tsigas (1997)]. The smaller the value of *RORFLEX*(*r*), the greater the responsiveness of international investment to a change in the rate of return in region *r*. Because *RORFLEX*(*r*) is indexed over regions, it is possible to have some regions where investment is quite sensitive to changing rates of return, and others where this is not.

14.5 Consumer Demand Elasticities

GTAP employs the constant difference of elasticities (CDE) functional form in the specification of private household demands. The CDE, introduced by Hanoch (1975), can be classified as somewhere between the non-homothetic CES and more flexible functional forms. It is based on the assumption of implicit additivity and allows for a richer representation of income effects on the demand system. The CDE implicit expenditure function is given by:

$$\sum_{i \in TRAD} B_{i,r} UP_r^{\beta_{i,r}\gamma_{i,r}} \left[PP_{i,r} / E_r(PP_r, UP_r) \right]^{\beta_{i,r}} \equiv 1.$$

where $E_r(.)$ represents the minimum expenditure required to attain a pre-specified level of private household utility, UP_r, given the vector of private household prices, PP_r. Individual prices are normalized using minimum expenditure and then raised to the power $\beta_{i,r}$ and combined in an additive form. The calibration problem involves choosing the values of the substitution parameter, $\beta_{i,r}$ or `SUBPAR(i,r)`, to replicate the desired compensated, own-price elasticities of demand, then choosing the expansion parameters, $\gamma_{i,r}$ or `INCPAR(i,r)` to replicate the targeted income elasticities of demand.

In previous versions of the GTAP Data Base, we obtained available estimates of income elasticities from cross-country demand studies. Two studies provided income elasticity estimates which have country and commodity coverage for use with the disaggregate GTAP sectors and region. These are the World Food Model of the Food and Agriculture Organization (FAO, 1993) and the cross-country demand study by Theil, Chung, and Seale (1989). In GTAP Data Base 9, as we did in version 6, we draw on the work done by Reimer and Hertel (2004) who estimated an implicit, directly additive demand system (AIDADS) first using cross-country data on consumer expenditures from the International Comparison Project (ICP) and then using GTAP data. The authors found that the two data sets produced results that are quite consistent despite their differing origins and the fact that the ICP data are based on consumer goods that embody wholesale\retail margins, while margins demand are treated separately in GTAP. Given the similarity of the results, the estimation based on GTAP data was found to be favorable since it readily matched the input-output-based production and trade data.

The AIDADS demand system was estimated for 10 commodity categories following the procedure of Cranfield *et al*. The mapping between the categories and the GTAP commodities is given in Table 14.3. The AIDADS parameter estimates based upon GTAP 9 data are presented in table 14.4. The first two columns of table 14.4 report α_n and β_n, which represent the bounds of the marginal budget shares. The parameter estimates appear to be quite sensible for all commodities. Consider, for example, the values corresponding to the "Grains, other crops" category in Table 14.4. Its α_n estimate indicates that at low income levels, this category accounts for 26 cents of each additional dollar of expenditure. However, its β_n estimate of zero suggests that at higher income levels, "Grains, other crops" is no longer part of any increases in expenditure. Note that α_n does not equal β_n for any category of expenditure. This suggests that there is a great richness of behavior that would have been missed had we assumed that α_n equal β_n such that marginal budget shares are constant, as in the LES demand system estimated by Hunter and Markusen (1988), among others. The estimated subsistence budget shares (γ_n) for "Meat, dairy, fish", "Utilities, other housing services", and "Transport, communication" are small while staple foods tend to have larger subsistence budget shares, at 0.122 and 0.031 for "Grains, other crops" and "Processed food, beverages, tobacco", respectively. This indicates that staple food products are necessary for survival at the lowest levels of income, whereas utilities, transport, and communications are not.

The estimates α_n, β_n, and γ_n obtained by Reimer and Hertel (2004) were updated with GTAP data on private consumption (VPA) and imports at market and world prices to generate income elasticity estimates for the 10 commodity categories for each of the 140 regions in GTAP 9. Estimates of own-price elasticities of demand were generated using the relationship for directly additive preferences proposed by Frisch (1959) and embodied in the Linear Expenditure System (LES). As discussed in Huff *et al.* (1997), the CDE is a more flexible functional form than the LES, and we could have used independent information on own-price demand elasticities in this calibration had it been available. In the future, we hope to supplement the elasticities file with cross-country studies of own-price responses. In addition, by using the CDE, GTAP modelers are given the flexibility to adjust commodity-specific substitution effects to conform with outside information on own-price elasticities of demand for key commodities in any particular application.

Using the income elasticity estimates, the values for own-price elasticities of demand were computed following the procedure and formula outlined in Zeitsch et al. (1991):

$$\varepsilon_{ii} = -s_i \eta_i \left(1 + \frac{\eta_i}{\omega}\right) + \frac{\eta_i}{\omega},$$

where ε_{ii} is the uncompensated own-price elasticity of demand for commodity i; η_i is the income elasticity of demand for commodity i, s_i is the expenditure share of commodity i, and ω is the Frisch parameter, that is, minus the reciprocal of the marginal utility of income, or the money flexibility. The compensated own-price elasticities, ν_{ii}, are then computed as:

$$\nu_{ii} = -\varepsilon_{ii} + s_i \eta_i$$

Using the above methods, we end up with estimates for income and compensated own-price elasticities of demand for 10 commodity categories and 120 regions.[1] These are then used as targets in the CDE calibration procedure.

14.6 CDE Calibration Procedure

The calibration problem involves choosing the values of the substitution parameter, $\beta_{i,r}$ or `SUBPAR(i,r)`, to replicate the desired compensated, own-price elasticities of demand, then choosing the expansion parameters, $\gamma_{i,r}$ or `INCPAR(i,r)` to replicate the targeted income elasticities of demand. The calibration of the CDE parameters for GTAP 9 follows the procedure used in the GTAP 4 data base which is discussed more fully in Liu, et al. (1998). The procedure is a modification of Surry's (1997) approach which uses *maximum entropy* to calibrate a non-homethetic CDE expenditure function with subsistence quantities for three goods. Surry's procedure was modified to accommodate a larger number of goods with widely varying budget shares.

The income elasticities, expenditure shares, and uncompensated direct price elasticities serve as target inputs into the calibration program. Fuzzy constraints were introduced into the model to permit departures from the target elasticities and to provide room for mutually inconsistent target inputs. The two constraints in the form of income elasticities of demand and uncompensated direct price elasticities of demand, became, respectively:

$$\eta_i(\text{estimated}) = \eta_i + \text{diff1} = \frac{\sum_k s_k e_k \alpha_k + e_i(1-\alpha_i)}{\sum_k s_k e_k} + \alpha_i - \sum_k s_k \alpha_k \text{ , and}$$

$$\varepsilon_{ii}(\text{estimated}) = \varepsilon_{ii} + \text{diff2} = -\nu_{ii} + s_i \eta_i = s_i \left[2\alpha_i - \sum_k s_k \alpha_k\right] - \alpha_i + s_i \eta_i \text{ .}$$

where η_i, s_i , e_i, α_i, ν_{ii}, ε_{ii} are income elasticity, expenditure share, expansion parameter, substitution parameter, compensated own direct price elasticity, and uncompensated direct price elasticity, respectively, for commodity i. We have target values for η_i, s_i, and ε_{ii} as inputs while e_i and α_i are positive variables in the program.

[1] The estimation is done for all primary regions, i.e. individual countries of which there are 120 in GTAP 9.0.

Harsh penalties were imposed on the absolute values of *diff1* and *diff2* to ensure minimal departures from the target elasticities. The approach turned out to be quite robust with respect to these departures.

Since the inclusion of more commodities increases the possibility that the program will not converge, we used the same 10 commodities categories for the CDE calibration. Tables 14.5 and 14.6 report the income and uncompensated own-price demand elasticity targets for all 140 regions and 10 commodity categories, respectively. After the estimation was done for the aggregated commodities, the CDE parameters for the aggregated system were then extended to the 57 commodity level by assuming that all in-group commodities have the same parameter estimates as their aggregated parents.

References

Frisch, R. 1959. "A Complete Scheme for Computing All Direct and Cross Elasticities in a Model with Many Sectors," *Econometrics* 27:177─196.

Hanoch, G. 1975. “Production and Demand Models with Direct and Indirect Implicit Additivity,” Econometrica. 43:395-419.

Hertel, T.H. (Editor). 1997. *Global Trade Analysis: Modeling and Applications*. Cambridge University Press.

Hertel, T.H., D. Hummels, M. Ivanic, and R. Keeney. 2004. How Confident Can We Be in CGE-Based Assessments of Free Trade Agreements? GTAP Working Paper No. 26, Center for Global Trade Analysis, West Lafayette, Indiana.

Huff, K., K. Hanslow, T.W. Hertel, and M.E. Tsigas 1997. “GTAP Behavior Parameters,” in T.W. Hertel (ed), *Global Trade Analysis: Modeling and Applications*. Cambridge University Press.

Hummels, D.. 1999. Toward a Geography of Trade Cost, GTAP Working Paper No.17, Center for Global Trade Analysis, West Lafayette, Indiana.

Jomini, P., R. McDougall, G. Watts, and P.S. Dee. 1994. The SALTER Model of the World Economy: Model Stricture, Data Base and Parameters. Canberra, Australia: Industry Commission.

Jomini, P., J.F. Zeitsch, R. McDougall, A. Welsh, S. Brown, J.Hambley and J. Kelly. 1991. SALTER: A General Equilibrium Model of the World Economy, Vol. 1. Model Structure, Data Base, and Parameters. Canberra, Australia: Industry Commission.

Liu, J., Y. Surry, B. Dimaranan and T. Hertel. 1998. “CDE Calibration,” Chapter 21 in Robert McDougall, Aziz Elbehri, and Truong P. Truong. *Global Trade, Assistance and Protection: The GTAP 4 Data Base*, Center for Global Trade Analysis, Purdue University, West Lafayette, Indiana.

Lluch, C., A. Powell, and R. Williams. 1977. Patterns in Household Demand and Savings. New York: Oxford University Press.

Reimer, J. And T. W. Hertel. 2004. International Cross Section Estimates of Demand for Use in the GTAP Model, GTAP Technical paper No. 23, Center for Global Trade Analysis, West Lafayette, Indiana.

Surry, Y. 1997. Applying and Generalizing the CDE and LES Demand Systems in CGE Models. Unpublished Paper. INRA Centre de Rennes, France.

Theil, H., C.F. Chung, and J. L. Seale, Jr. 1989. International Evidence on Consumption Patterns. Supplement 1 to Advances in Econometrics. Greenwich, CT: JAI Press.

Theil, H. and K.W. Clements. 1987. Applied Demand Analysis: Results from System-Wide Approaches. Cambridge, MA: Ballinger Publishing Company.

Zeitsch, J., R. McDougall, P. Jomini, A. Welsh, J. Hambley, S. Brown, and J. Kelly. 1991. “SALTER: A General Equilibrium Model of the World Economy.” SALTER Working Paper N. 4. Canberra, Australia: Industry Commission.

Table 14.2 GTAP Substitution Elasticities

GTAP Commodities		Domestic/ Imported (σ_D)	Sourcing of Imports (σ_M)	Value-added (σ_{VA})
pdr	Paddy rice	5.05	10.10	0.26
wht	Wheat	4.45	8.90	0.26
gro	Cereal grains not elsewhere classified (n.e.c.)	1.30	2.60	0.26
v_f	Vegetables, fruit, nuts	1.85	3.70	0.26
osd	Oil seeds	2.45	4.90	0.26
c_b	Sugar cane, sugar beet	2.70	5.40	0.26
pfb	Plant-based fibers	2.50	5.00	0.26
ocr	Crops n.e.c.	3.25	6.50	0.26
ctl	Bovine cattle, sheep and goats,	2.00	4.00	0.26
oap	Animal products n.e.c.	1.30	2.60	0.26
rmk	Raw milk	3.65	7.30	0.26
wol	Wool, silk-worm cocoons	6.45	12.90	0.26
frs	Forestry	2.50	5.00	0.20
fsh	Fishing	1.25	2.50	0.20
coa	Coal	3.05	6.10	0.20
oil	Oil	5.20	10.40	0.20
gas	Gas	17.20	34.40	0.20
omn	Minerals n.e.c.	0.90	1.80	0.20
cmt	Bovine meat prods	3.85	7.70	1.12
omt	Meat products n.e.c.	4.40	8.80	1.12
vol	Vegetable oils and fats	3.30	6.60	1.12
mil	Dairy products	3.65	7.30	1.12
pcr	Processed rice	2.60	5.20	1.12
sgr	Sugar	2.70	5.40	1.12
ofd	Food products n.e.c.	2.00	4.00	1.12
b_t	Beverages and tobacco products	1.15	2.30	1.12
tex	Textiles	3.75	7.50	1.26
wap	Wearing apparel	3.70	7.40	1.26
lea	Leather products	4.05	8.10	1.26
lum	Wood products	3.40	6.80	1.26
ppp	Paper products, publishing	2.95	5.90	1.26
p_c	Petroleum, coal products	2.10	4.20	1.26
crp	Chemical, rubber, plastic products	3.30	6.60	1.26
nmm	Mineral products n.e.c.	2.90	5.80	1.26
i_s	Ferrous metals	2.95	5.90	1.26
nfm	metals n.e.c.	4.20	8.40	1.26
fmp	Metal products	3.75	7.50	1.26
mvh	Motor vehicles and parts	2.80	5.60	1.26
otn	Transport equipment n.e.c.	4.30	8.60	1.26
ele	Electronic equipment	4.40	8.80	1.26
ome	Machinery and equipment n.e.c.	4.05	8.10	1.26
omf	Manufactures n.e.c.	3.75	7.50	1.26
ely	Electricity	2.80	5.60	1.26

Continued

Table 14.2 GTAP Substitution Elasticities (Contd)

GTAP Commodities		Domestic/ Imported (σ_D)	Sourcing of Imports (σ_M)	Value-added (σ_{VA})
gdt	Gas manufacture, distribution	2.80	5.60	1.26
wtr	Water	2.80	5.60	1.26
cns	Construction	1.90	3.80	1.40
trd	Trade	1.90	3.80	1.68
otp	Transport n.e.c.	1.90	3.80	1.68
wtp	Water transport	1.90	3.80	1.68
atp	Air transport	1.90	3.80	1.68
cmn	Communication	1.90	3.80	1.26
ofi	Financial services n.e.c.	1.90	3.80	1.26
isr	Insurance	1.90	3.80	1.26
obs	Business services n.e.c.	1.90	3.80	1.26
ros	Recreational and other services	1.90	3.80	1.26
osg	Public Admin, Defense, Education,	1.90	3.80	1.26
dwe	Dwellings	1.90	3.80	1.26

Table 14.3 Mapping of GTAP Commodities with 10 Commodity Aggregates

GTAP Sectors	Aggregated Commodities	GTAP Sectors	Aggregated Commodities
pdr	GrainCrops	lum	Mnfcs
wht	GrainCrops	ppp	Mnfcs
gro	GrainCrops	p_c	TransComm
v_f	GrainCrops	crp	Mnfcs
osd	GrainCrops	nmm	Mnfcs
c_b	GrainCrops	i_s	Mnfcs
pfb	TextAppar	nfm	Mnfcs
ocr	GrainCrops	fmp	Mnfcs
ctl	MeatDairy	mvh	Mnfcs
oap	MeatDairy	otn	TransComm
rmk	MeatDairy	ele	Mnfcs
wol	TextAppar	ome	Mnfcs
for	Mnfcs	omf	Mnfcs
fsh	MeatDairy	ely	HousUtils
col	HousUtils	gdt	HousUtils
oil	TransComm	wtr	HousUtils
gas	HouseUtils	cns	HousUtils
omn	Mnfcs	trd	WRTrade
cmt	MeatDairy	otp	TransComm
omt	MeatDairy	wtp	TransComm
vol	OthFoodBev	atp	TransComm
mil	MeatDairy	cmn	TransComm
pcr	GrainCrops	ofi	FinService
sgr	OthFoodBev	isr	HousUtils
ofd	OthFoodBev	obs	FinService
b_t	OthFoodBev	ros	HousOthServ
tex	TextAppar	osg	HousOthServ
wap	TextAppar	dwe	HousOthServ
lea	TextAppar		

Table 14.4 GTAP-Based AIDADS Estimates: Household Consumption Expenditures

Commodity Categories	α_n	β_n	γ_n
Grains, other crops	0.259	0.000	0.122
Meat, dairy, fish	0.153	0.053	0.000
Processed food, beverages, tobacco	0.248	0.054	0.031
Textiles, apparel, footwear	0.117	0.038	0.000
Utilities, housing services	0.027	0.068	0.042
Wholesale/retail trade	0.009	0.175	0.000
Manufactures, electronics	0.052	0.158	0.253
Transport Communication	0.104	0.133	0.000
Financial and business services	0.002	0.079	0.004
Housing, education, health, public services	0.029	0.243	0.240

Source: Author's calculations based on Reimer and Hertel (2004) and GTAP 9.

Table 14.5 Target Income Elasticities of Demand

GTAP Regions	Grain-Crops	Meat-Dairy	Oth-FoodBev	Text-Appar	Hous-Util	WRtrade	Mnfcs	Trans-Comm	Fin-Service	Hous-OtherServ
aus	-0.002	0.914	0.855	0.909	1.009	1.026	1.009	0.995	1.027	1.023
nzl	0.008	0.883	0.802	0.876	1.027	1.054	1.026	1.003	1.056	1.048
xoc	0.298	0.642	0.546	0.632	1.016	1.189	0.993	0.926	1.201	1.150
chn	0.444	0.699	0.620	0.691	1.061	1.315	1.009	0.970	1.333	1.253
hkg	0.008	0.899	0.818	0.892	1.043	1.070	1.043	1.020	1.072	1.065
jpn	-0.002	0.907	0.838	0.901	1.024	1.045	1.024	1.006	1.047	1.041
kor	0.004	0.814	0.700	0.804	1.051	1.101	1.050	1.009	1.105	1.091
mng	0.561	0.788	0.716	0.781	1.137	1.473	1.052	1.055	1.496	1.386
twn	0.052	0.790	0.674	0.780	1.046	1.104	1.045	1.000	1.108	1.092
xea	0.555	0.698	0.651	0.694	0.890	1.267	0.772	0.869	1.290	1.155
brn	0.045	0.782	0.672	0.773	1.019	1.072	1.017	0.977	1.075	1.061
khm	0.695	0.859	0.804	0.855	1.017	1.543	0.808	1.037	1.569	1.373
idn	0.447	0.707	0.627	0.699	1.073	1.328	1.023	0.982	1.346	1.266
lao	0.746	0.943	0.880	0.938	1.193	1.718	1.008	1.172	1.748	1.560
mys	0.178	0.698	0.577	0.686	1.067	1.186	1.059	0.989	1.194	1.160
phl	0.453	0.694	0.620	0.686	1.042	1.306	0.989	0.955	1.325	1.241
sgp	0.010	0.867	0.784	0.860	1.017	1.045	1.016	0.993	1.047	1.040
tha	0.321	0.679	0.579	0.669	1.079	1.269	1.052	0.982	1.283	1.226
vnm	0.597	0.793	0.730	0.787	1.093	1.471	0.984	1.031	1.496	1.367
xse	0.777	0.949	0.892	0.945	1.079	1.687	0.855	1.128	1.713	1.482
bgd	0.749	0.916	0.862	0.913	0.964	1.610	0.711	1.066	1.627	1.377
ind	0.608	0.785	0.723	0.780	1.014	1.453	0.870	0.988	1.480	1.324
npl	0.733	0.901	0.845	0.898	0.986	1.596	0.732	1.060	1.617	1.383
pak	0.735	0.948	0.877	0.942	1.257	1.743	1.087	1.205	1.774	1.604
lka	0.466	0.771	0.678	0.761	1.190	1.468	1.134	1.084	1.488	1.400
xsa	0.720	0.888	0.833	0.884	1.047	1.592	0.839	1.071	1.619	1.415
can	-0.002	0.905	0.838	0.899	1.017	1.037	1.017	0.999	1.039	1.033
usa	-0.003	0.916	0.860	0.911	1.007	1.024	1.007	0.994	1.025	1.020
mex	0.137	0.725	0.601	0.713	1.068	1.165	1.063	0.999	1.172	1.145
xna	-0.005	0.940	0.892	0.937	1.017	1.030	1.016	1.005	1.031	1.027
arg	0.078	0.757	0.637	0.746	1.043	1.112	1.040	0.989	1.117	1.098
bol	0.535	0.759	0.688	0.752	1.100	1.416	1.024	1.019	1.438	1.335
bra	0.104	0.742	0.618	0.730	1.058	1.141	1.053	0.997	1.147	1.124
chl	0.082	0.764	0.643	0.753	1.055	1.126	1.053	1.000	1.131	1.111
col	0.221	0.682	0.568	0.671	1.065	1.201	1.051	0.980	1.211	1.172

Continued

Table 14.5 Target Income Elasticities of Demand

GTAP Regions	Grain-Crops	Meat-Dairy	Oth-FoodBev	Text-Appar	Hous-Util	WRtrade	Mnfcs	Trans-Comm	Fin-Service	Hous-OtherServ
dom	0.354	0.761	0.648	0.750	1.203	1.407	1.177	1.097	1.422	1.361
ecu	0.349	0.713	0.610	0.702	1.122	1.318	1.094	1.023	1.332	1.273
pry	0.326	0.770	0.651	0.758	1.214	1.400	1.194	1.110	1.414	1.359
per	0.067	0.780	0.662	0.769	1.053	1.117	1.050	1.003	1.121	1.104
ury	0.136	0.754	0.623	0.741	1.114	1.216	1.106	1.041	1.223	1.194
ven	0.225	0.736	0.610	0.723	1.148	1.292	1.134	1.057	1.303	1.261
xsm	0.195	0.741	0.613	0.729	1.141	1.272	1.132	1.055	1.281	1.244
cri	0.383	0.736	0.635	0.726	1.156	1.373	1.125	1.053	1.389	1.323
gtm	0.552	0.791	0.716	0.784	1.153	1.483	1.076	1.066	1.506	1.398
hnd	0.587	0.800	0.732	0.794	1.128	1.491	1.035	1.055	1.515	1.394
jam	0.080	0.817	0.685	0.804	1.134	1.212	1.130	1.074	1.217	1.196
nic	0.327	0.774	0.654	0.762	1.221	1.410	1.201	1.116	1.424	1.368
pan	0.394	0.799	0.676	0.787	1.281	1.526	1.241	1.162	1.544	1.470
pri	0.215	0.727	0.603	0.714	1.124	1.260	1.113	1.038	1.270	1.231
slv	0.211	0.697	0.578	0.685	1.084	1.218	1.071	0.999	1.228	1.189
tto	0.009	0.856	0.777	0.849	1.000	1.027	0.999	0.977	1.029	1.021
xca	0.109	0.772	0.635	0.759	1.133	1.231	1.127	1.061	1.238	1.210
xcb	0.345	0.726	0.619	0.715	1.147	1.345	1.113	1.046	1.359	1.300
aut	0.001	0.908	0.840	0.902	1.022	1.043	1.022	1.005	1.045	1.039
bel	0.002	0.911	0.841	0.905	1.031	1.053	1.031	1.012	1.055	1.049
cyp	0.020	0.862	0.765	0.853	1.047	1.083	1.046	1.016	1.086	1.076
cze	0.063	0.821	0.700	0.810	1.093	1.155	1.091	1.043	1.159	1.142
dnk	0.000	0.916	0.850	0.910	1.026	1.046	1.025	1.009	1.047	1.042
est	0.069	0.812	0.690	0.801	1.092	1.158	1.090	1.041	1.162	1.144
fin	0.001	0.908	0.840	0.902	1.024	1.045	1.023	1.006	1.046	1.040
fra	0.004	0.894	0.819	0.888	1.026	1.050	1.026	1.005	1.052	1.046
deu	0.003	0.903	0.831	0.897	1.028	1.051	1.028	1.008	1.052	1.046
grc	0.009	0.890	0.806	0.882	1.041	1.070	1.041	1.017	1.072	1.064
hun	0.080	0.789	0.666	0.778	1.081	1.151	1.079	1.027	1.157	1.137
irl	0.012	0.879	0.792	0.872	1.039	1.070	1.038	1.013	1.072	1.063
ita	0.006	0.893	0.815	0.886	1.030	1.056	1.030	1.008	1.057	1.050
lva	0.072	0.873	0.742	0.861	1.171	1.240	1.169	1.117	1.245	1.226
ltu	0.066	0.888	0.757	0.876	1.180	1.247	1.178	1.127	1.252	1.233
lux	-0.005	0.966	0.931	0.963	1.019	1.028	1.019	1.011	1.029	1.026
mlt	0.006	0.912	0.831	0.905	1.056	1.083	1.055	1.033	1.085	1.077

Continued

Table 14.5 Target Income Elasticities of Demand

GTAP Regions	Grain-Crops	Meat-Dairy	Oth-FoodBev	Text-Appar	Hous-Util	WRtrade	Mnfcs	Trans-Comm	Fin-Service	Hous-OtherServ
nld	0.006	0.887	0.808	0.880	1.026	1.052	1.025	1.004	1.054	1.047
pol	0.085	0.774	0.651	0.763	1.071	1.144	1.069	1.015	1.149	1.129
prt	0.027	0.847	0.745	0.838	1.048	1.089	1.047	1.014	1.092	1.080
svk	0.061	0.821	0.701	0.810	1.089	1.150	1.088	1.041	1.154	1.138
svn	0.026	0.859	0.757	0.850	1.061	1.102	1.060	1.027	1.105	1.094
esp	0.013	0.865	0.776	0.858	1.031	1.063	1.030	1.004	1.065	1.057
swe	0.001	0.911	0.842	0.906	1.028	1.049	1.028	1.010	1.051	1.045
gbr	0.002	0.904	0.833	0.898	1.025	1.047	1.024	1.006	1.049	1.043
che	-0.008	0.943	0.901	0.939	1.007	1.018	1.007	0.998	1.019	1.016
nor	-0.009	0.940	0.891	0.936	1.016	1.030	1.016	1.005	1.030	1.027
xef	-0.005	0.932	0.876	0.927	1.024	1.040	1.023	1.010	1.041	1.036
alb	0.268	0.708	0.594	0.697	1.112	1.269	1.097	1.019	1.280	1.234
bgr	0.198	0.726	0.603	0.714	1.111	1.236	1.103	1.028	1.245	1.209
blr	0.279	0.770	0.643	0.757	1.214	1.385	1.196	1.113	1.397	1.347
hrv	0.083	0.836	0.703	0.823	1.152	1.228	1.149	1.093	1.234	1.213
rou	0.144	0.817	0.678	0.803	1.191	1.294	1.186	1.116	1.302	1.273
rus	0.125	0.742	0.614	0.730	1.091	1.188	1.084	1.021	1.195	1.168
ukr	0.393	0.715	0.621	0.705	1.117	1.338	1.082	1.017	1.354	1.286
xee	0.455	0.734	0.650	0.725	1.122	1.383	1.074	1.025	1.401	1.319
xer	0.180	0.711	0.588	0.699	1.082	1.200	1.075	1.004	1.209	1.175
kaz	0.185	0.780	0.645	0.767	1.182	1.307	1.172	1.097	1.316	1.280
kgz	0.607	0.846	0.770	0.838	1.213	1.577	1.122	1.127	1.602	1.482
xsu	0.662	0.821	0.770	0.817	0.993	1.480	0.812	1.000	1.506	1.326
arm	0.403	0.795	0.683	0.783	1.249	1.476	1.218	1.139	1.492	1.424
aze	0.405	0.792	0.682	0.781	1.247	1.477	1.212	1.136	1.493	1.424
geo	0.404	0.793	0.682	0.781	1.246	1.472	1.216	1.135	1.488	1.420
bhr	0.044	0.784	0.672	0.774	1.026	1.080	1.024	0.983	1.084	1.069
irn	0.291	0.699	0.589	0.688	1.114	1.292	1.084	1.016	1.305	1.252
isr	0.009	0.881	0.792	0.874	1.046	1.078	1.046	1.019	1.080	1.072
jor	0.246	0.713	0.594	0.701	1.118	1.269	1.102	1.027	1.280	1.236
kwt	0.054	0.786	0.672	0.776	1.039	1.096	1.037	0.993	1.100	1.084
omn	0.124	0.713	0.592	0.701	1.040	1.130	1.035	0.975	1.137	1.111
qat	0.059	0.769	0.654	0.758	1.027	1.086	1.025	0.980	1.090	1.074
sau	0.129	0.750	0.623	0.738	1.095	1.190	1.090	1.026	1.197	1.170
tur	0.087	0.784	0.652	0.772	1.120	1.206	1.117	1.055	1.213	1.188

Continued

Table 14.5 Target Income Elasticities of Demand

GTAP Regions	Grain-Crops	Meat-Dairy	Oth-FoodBev	Text-Appar	Hous-Util	WRtrade	Mnfcs	Trans-Comm	Fin-Service	Hous-OtherServ
are	0.001	0.922	0.850	0.916	1.045	1.067	1.044	1.025	1.068	1.062
xws	0.458	0.780	0.684	0.771	1.207	1.467	1.159	1.101	1.486	1.406
egy	0.428	0.752	0.654	0.742	1.173	1.418	1.125	1.068	1.436	1.361
mar	0.505	0.802	0.711	0.793	1.225	1.524	1.168	1.119	1.546	1.451
tun	0.361	0.756	0.644	0.744	1.207	1.428	1.177	1.097	1.444	1.377
xnf	0.492	0.763	0.680	0.755	1.154	1.437	1.090	1.056	1.457	1.367
ben	0.710	0.914	0.847	0.908	1.198	1.681	1.021	1.156	1.711	1.541
bfa	0.825	1.028	0.963	1.026	0.903	1.742	0.575	1.147	1.716	1.381
cmr	0.676	0.841	0.785	0.836	1.038	1.523	0.846	1.033	1.550	1.373
civ	0.748	0.936	0.875	0.931	1.158	1.699	0.958	1.151	1.729	1.531
gha	0.736	0.963	0.890	0.957	1.288	1.782	1.127	1.231	1.814	1.642
gin	0.884	1.097	1.028	1.094	1.060	1.897	0.718	1.248	1.899	1.565
nga	0.655	0.971	0.871	0.961	1.442	1.828	1.344	1.326	1.856	1.731
sen	0.701	0.886	0.826	0.881	1.123	1.616	0.947	1.103	1.645	1.468
tgo	0.783	0.970	0.908	0.965	1.146	1.744	0.912	1.171	1.773	1.550
xwf	0.750	0.919	0.863	0.915	1.009	1.626	0.763	1.081	1.649	1.411
xcf	0.642	0.805	0.750	0.801	0.994	1.462	0.808	0.990	1.488	1.317
xac	0.703	0.871	0.815	0.867	1.036	1.566	0.837	1.054	1.593	1.395
eth	0.905	1.174	1.080	1.172	0.869	1.930	0.484	1.278	1.813	1.408
ken	0.782	0.967	0.905	0.963	1.107	1.731	0.867	1.154	1.759	1.521
mdg	0.839	1.041	0.975	1.039	0.892	1.755	0.558	1.156	1.719	1.375
mwi	0.945	1.239	1.138	1.237	0.880	2.019	0.491	1.342	1.868	1.442
mus	0.134	0.772	0.642	0.760	1.122	1.219	1.118	1.053	1.226	1.198
moz	0.853	1.065	0.998	1.063	0.910	1.795	0.578	1.182	1.757	1.404
rwa	0.864	1.063	1.000	1.061	1.003	1.827	0.683	1.202	1.823	1.493
tza	0.863	1.093	1.012	1.091	0.915	1.840	0.564	1.210	1.792	1.425
uga	0.764	0.967	0.897	0.965	0.786	1.618	0.479	1.066	1.564	1.236
zmb	0.771	0.939	0.885	0.936	1.056	1.666	0.833	1.113	1.690	1.458
zwe	0.678	0.842	0.786	0.838	1.015	1.525	0.802	1.026	1.552	1.363
xec	0.653	0.822	0.767	0.818	1.026	1.497	0.848	1.015	1.523	1.352
bwa	0.317	0.687	0.585	0.677	1.084	1.264	1.062	0.989	1.277	1.223
nam	0.386	0.745	0.642	0.734	1.170	1.387	1.139	1.066	1.403	1.337
zaf	0.205	0.713	0.591	0.701	1.103	1.234	1.092	1.018	1.244	1.206
xsc	0.600	0.795	0.732	0.789	1.094	1.469	0.981	1.032	1.494	1.366
xtw	0.025	0.842	0.744	0.834	1.035	1.074	1.035	1.003	1.077	1.067

Table 14.6 Target Uncompensated Own-Price Elasticities of Demand

GTAP Regions	Grain-Crops	Meat-Dairy	Oth-FoodBev	Text-Appar	Hous-Util	WRtrade	Mnfcs	Trans-Comm	Fin-Service	Hous-OtherServ
aus	-0.002	0.828	0.744	0.821	0.886	0.713	0.849	0.833	0.886	0.561
nzl	0.006	0.651	0.575	0.654	0.745	0.608	0.718	0.679	0.721	0.548
xoc	0.120	0.250	0.210	0.252	0.397	0.358	0.360	0.286	0.430	0.321
chn	0.184	0.276	0.235	0.278	0.422	0.455	0.373	0.362	0.531	0.337
hkg	0.006	0.639	0.577	0.567	0.743	0.518	0.603	0.694	0.764	0.701
jpn	-0.002	0.734	0.642	0.728	0.790	0.650	0.778	0.731	0.821	0.526
kor	0.003	0.522	0.438	0.512	0.646	0.568	0.614	0.590	0.678	0.468
mng	0.178	0.226	0.209	0.216	0.309	0.429	0.325	0.274	0.469	0.369
twn	0.032	0.472	0.402	0.477	0.609	0.536	0.556	0.554	0.660	0.434
xea	0.185	0.222	0.204	0.226	0.289	0.288	0.246	0.248	0.408	0.222
brn	0.037	0.637	0.540	0.614	0.772	0.722	0.712	0.607	0.673	0.786
khm	0.135	0.160	0.145	0.171	0.209	0.285	0.149	0.197	0.323	0.212
idn	0.150	0.240	0.203	0.241	0.371	0.379	0.319	0.301	0.449	0.281
lao	0.125	0.184	0.138	0.194	0.249	0.335	0.204	0.228	0.369	0.271
mys	0.089	0.340	0.274	0.337	0.453	0.482	0.376	0.448	0.570	0.482
phl	0.139	0.201	0.182	0.212	0.319	0.298	0.286	0.261	0.374	0.290
sgp	0.009	0.742	0.663	0.735	0.851	0.726	0.758	0.777	0.774	0.651
tha	0.127	0.266	0.222	0.257	0.417	0.323	0.358	0.340	0.477	0.438
vnm	0.143	0.184	0.159	0.193	0.259	0.306	0.214	0.236	0.371	0.278
xse	0.123	0.185	0.135	0.192	0.220	0.320	0.174	0.218	0.354	0.248
bgd	0.118	0.164	0.155	0.166	0.182	0.306	0.132	0.171	0.306	0.193
ind	0.149	0.191	0.177	0.199	0.265	0.304	0.218	0.219	0.372	0.275
npl	0.117	0.154	0.156	0.161	0.177	0.278	0.130	0.172	0.305	0.201
pak	0.133	0.172	0.144	0.156	0.237	0.333	0.199	0.222	0.357	0.302
lka	0.129	0.217	0.182	0.218	0.339	0.318	0.305	0.271	0.426	0.373
xsa	0.117	0.153	0.144	0.163	0.191	0.271	0.136	0.179	0.302	0.212
can	-0.001	0.758	0.675	0.755	0.833	0.682	0.774	0.777	0.784	0.627
usa	-0.002	0.765	0.707	0.755	0.809	0.725	0.765	0.787	0.799	0.469
mex	0.067	0.341	0.271	0.341	0.512	0.475	0.449	0.400	0.548	0.355
xna	-0.005	0.844	0.763	0.842	0.875	0.816	0.818	0.700	0.872	0.720
arg	0.043	0.398	0.330	0.399	0.558	0.449	0.510	0.489	0.573	0.403
bol	0.151	0.204	0.186	0.217	0.310	0.368	0.275	0.226	0.404	0.303
bra	0.055	0.379	0.313	0.376	0.532	0.496	0.475	0.463	0.551	0.422
chl	0.046	0.406	0.335	0.400	0.562	0.505	0.517	0.474	0.569	0.442
col	0.098	0.293	0.242	0.291	0.460	0.389	0.428	0.376	0.427	0.444

Continued

Table 14.6 Target Uncompensated Own-Price Elasticities of Demand

GTAP Regions	Grain-Crops	Meat-Dairy	Oth-FoodBev	Text-Appar	Hous-Util	WRtrade	Mnfcs	Trans-Comm	Fin-Service	Hous-OtherServ
dom	0.123	0.248	0.215	0.254	0.422	0.472	0.334	0.310	0.474	0.411
ecu	0.120	0.221	0.196	0.236	0.365	0.328	0.303	0.313	0.459	0.384
pry	0.118	0.264	0.222	0.260	0.435	0.449	0.342	0.345	0.507	0.440
per	0.036	0.407	0.338	0.402	0.553	0.461	0.516	0.491	0.605	0.370
ury	0.066	0.338	0.280	0.342	0.525	0.433	0.448	0.452	0.579	0.452
ven	0.095	0.295	0.234	0.299	0.466	0.470	0.394	0.403	0.512	0.417
xsm	0.087	0.305	0.253	0.316	0.494	0.489	0.349	0.432	0.551	0.444
cri	0.118	0.220	0.182	0.221	0.362	0.392	0.308	0.316	0.424	0.256
gtm	0.150	0.201	0.170	0.209	0.308	0.379	0.254	0.270	0.406	0.305
hnd	0.142	0.187	0.159	0.189	0.274	0.344	0.228	0.234	0.331	0.317
jam	0.035	0.336	0.289	0.294	0.476	0.503	0.381	0.395	0.495	0.420
nic	0.099	0.228	0.193	0.221	0.372	0.405	0.282	0.307	0.439	0.338
pan	0.129	0.246	0.189	0.244	0.415	0.487	0.313	0.338	0.478	0.438
pri	0.082	0.261	0.211	0.270	0.421	0.374	0.377	0.325	0.482	0.352
slv	0.083	0.265	0.212	0.268	0.399	0.325	0.385	0.354	0.458	0.358
tto	0.006	0.594	0.530	0.580	0.672	0.495	0.630	0.633	0.667	0.442
xca	0.062	0.423	0.307	0.424	0.603	0.583	0.571	0.484	0.617	0.613
xcb	0.125	0.251	0.212	0.250	0.391	0.418	0.344	0.312	0.469	0.402
aut	0.001	0.741	0.670	0.721	0.796	0.698	0.707	0.727	0.848	0.657
bel	0.001	0.725	0.634	0.705	0.786	0.735	0.681	0.733	0.810	0.615
cyp	0.012	0.483	0.469	0.504	0.628	0.581	0.583	0.552	0.652	0.461
cze	0.038	0.463	0.383	0.465	0.596	0.627	0.529	0.547	0.654	0.541
dnk	0.000	0.792	0.710	0.778	0.807	0.813	0.775	0.833	0.848	0.687
est	0.039	0.419	0.366	0.429	0.547	0.570	0.532	0.512	0.618	0.490
fin	0.001	0.723	0.670	0.733	0.794	0.759	0.717	0.739	0.801	0.575
fra	0.003	0.680	0.613	0.674	0.752	0.715	0.654	0.708	0.793	0.558
deu	0.002	0.711	0.619	0.691	0.767	0.727	0.670	0.728	0.803	0.595
grc	0.006	0.567	0.502	0.552	0.665	0.561	0.632	0.513	0.687	0.531
hun	0.042	0.384	0.334	0.402	0.522	0.534	0.470	0.469	0.587	0.452
irl	0.010	0.707	0.615	0.702	0.812	0.671	0.752	0.747	0.799	0.740
ita	0.004	0.647	0.588	0.626	0.730	0.631	0.648	0.684	0.757	0.591
lva	0.035	0.389	0.303	0.397	0.535	0.490	0.511	0.484	0.596	0.520
ltu	0.032	0.384	0.331	0.411	0.540	0.561	0.465	0.490	0.595	0.485
lux	-0.006	1.040	0.983	1.038	1.075	0.951	0.944	1.006	0.897	0.950
mlt	0.004	0.532	0.492	0.524	0.627	0.605	0.531	0.427	0.581	0.625

Continued

Table 14.6 Target Uncompensated Own-Price Elasticities of Demand

GTAP Regions	Grain-Crops	Meat-Dairy	Oth-FoodBev	Text-Appar	Hous-Util	WRtrade	Mnfcs	Trans-Comm	Fin-Service	Hous-OtherServ
nld	0.005	0.724	0.650	0.724	0.787	0.748	0.723	0.739	0.847	0.623
pol	0.045	0.374	0.334	0.392	0.495	0.542	0.468	0.481	0.578	0.440
prt	0.017	0.511	0.446	0.501	0.639	0.545	0.558	0.567	0.654	0.506
svk	0.035	0.416	0.384	0.442	0.568	0.588	0.488	0.526	0.632	0.508
svn	0.017	0.518	0.472	0.517	0.649	0.593	0.536	0.584	0.670	0.546
esp	0.010	0.598	0.524	0.583	0.704	0.510	0.657	0.658	0.719	0.576
swe	0.001	0.772	0.694	0.770	0.833	0.837	0.706	0.787	0.854	0.647
gbr	0.002	0.680	0.599	0.662	0.740	0.614	0.660	0.696	0.770	0.597
che	-0.008	0.917	0.881	0.932	0.966	0.844	0.924	0.913	0.986	0.593
nor	-0.010	0.960	0.915	0.984	1.032	0.887	0.974	0.907	1.012	0.795
xef	-0.004	0.784	0.730	0.788	0.827	0.776	0.744	0.775	0.854	0.635
alb	0.097	0.239	0.213	0.247	0.384	0.331	0.357	0.320	0.401	0.416
bgr	0.085	0.287	0.243	0.295	0.423	0.455	0.422	0.379	0.509	0.376
blr	0.103	0.247	0.239	0.281	0.359	0.495	0.410	0.348	0.523	0.436
hrv	0.042	0.370	0.345	0.403	0.545	0.571	0.446	0.462	0.530	0.592
rou	0.060	0.306	0.270	0.332	0.472	0.493	0.431	0.417	0.531	0.408
rus	0.067	0.362	0.310	0.379	0.531	0.431	0.491	0.473	0.593	0.567
ukr	0.132	0.232	0.195	0.236	0.285	0.364	0.327	0.298	0.443	0.401
xee	0.122	0.191	0.161	0.195	0.267	0.303	0.253	0.225	0.370	0.332
xer	0.079	0.295	0.246	0.300	0.418	0.453	0.403	0.363	0.493	0.391
kaz	0.086	0.320	0.289	0.342	0.517	0.515	0.491	0.455	0.607	0.469
kgz	0.121	0.161	0.151	0.119	0.218	0.270	0.218	0.211	0.330	0.300
xsu	0.179	0.206	0.207	0.218	0.221	0.306	0.218	0.261	0.430	0.351
arm	0.117	0.200	0.184	0.233	0.311	0.369	0.330	0.316	0.442	0.390
aze	0.151	0.291	0.242	0.296	0.471	0.475	0.411	0.366	0.558	0.518
geo	0.114	0.194	0.185	0.226	0.345	0.398	0.323	0.291	0.436	0.316
bhr	0.029	0.505	0.432	0.497	0.606	0.636	0.541	0.542	0.543	0.580
irn	0.123	0.287	0.244	0.290	0.457	0.438	0.428	0.376	0.518	0.397
isr	0.007	0.615	0.534	0.613	0.722	0.625	0.676	0.633	0.743	0.516
jor	0.090	0.251	0.209	0.249	0.351	0.442	0.311	0.318	0.451	0.349
kwt	0.047	0.676	0.576	0.662	0.739	0.886	0.766	0.716	0.808	0.768
omn	0.084	0.474	0.396	0.470	0.645	0.678	0.429	0.546	0.729	0.624
qat	0.064	0.818	0.697	0.804	1.016	1.039	0.897	0.852	0.998	0.895
sau	0.084	0.479	0.390	0.469	0.608	0.700	0.550	0.541	0.715	0.670
tur	0.041	0.353	0.289	0.341	0.513	0.504	0.454	0.411	0.460	0.484

Continued

Table 14.6 Target Uncompensated Own-Price Elasticities of Demand

GTAP Regions	Grain-Crops	Meat-Dairy	Oth-FoodBev	Text-Appar	Hous-Util	WRtrade	Mnfcs	Trans-Comm	Fin-Service	Hous-OtherServ
are	0.000	0.690	0.628	0.659	0.744	0.691	0.533	0.667	0.728	0.698
xws	0.142	0.230	0.204	0.245	0.364	0.416	0.352	0.290	0.458	0.398
egy	0.126	0.219	0.184	0.209	0.338	0.375	0.305	0.271	0.418	0.329
mar	0.139	0.220	0.189	0.224	0.351	0.419	0.307	0.296	0.460	0.306
tun	0.116	0.242	0.207	0.236	0.393	0.383	0.327	0.337	0.428	0.433
xnf	0.174	0.271	0.243	0.274	0.415	0.433	0.357	0.357	0.484	0.484
ben	0.115	0.154	0.127	0.120	0.209	0.273	0.164	0.171	0.299	0.251
bfa	0.125	0.161	0.140	0.177	0.160	0.277	0.095	0.190	0.305	0.222
cmr	0.136	0.182	0.162	0.188	0.241	0.287	0.180	0.216	0.312	0.297
civ	0.124	0.192	0.168	0.187	0.240	0.357	0.171	0.216	0.317	0.312
gha	0.127	0.193	0.170	0.194	0.274	0.385	0.199	0.246	0.390	0.313
gin	0.107	0.133	0.122	0.136	0.149	0.273	0.089	0.170	0.269	0.212
nga	0.113	0.203	0.197	0.222	0.328	0.379	0.290	0.292	0.407	0.386
sen	0.132	0.165	0.148	0.178	0.225	0.332	0.179	0.194	0.302	0.291
tgo	0.114	0.148	0.108	0.131	0.182	0.275	0.135	0.153	0.283	0.233
xwf	0.121	0.155	0.135	0.155	0.179	0.270	0.122	0.120	0.287	0.229
xcf	0.204	0.243	0.212	0.255	0.313	0.469	0.234	0.273	0.355	0.376
xac	0.165	0.199	0.166	0.209	0.251	0.381	0.184	0.240	0.384	0.250
eth	0.089	0.142	0.127	0.142	0.118	0.264	0.062	0.165	0.248	0.170
ken	0.109	0.164	0.143	0.170	0.200	0.321	0.147	0.202	0.314	0.222
mdg	0.115	0.135	0.117	0.157	0.129	0.278	0.085	0.159	0.243	0.217
mwi	0.097	0.152	0.117	0.158	0.115	0.271	0.059	0.170	0.240	0.175
mus	0.059	0.323	0.260	0.327	0.473	0.526	0.378	0.376	0.439	0.477
moz	0.107	0.159	0.135	0.163	0.144	0.284	0.087	0.160	0.277	0.196
rwa	0.095	0.165	0.134	0.168	0.162	0.287	0.101	0.183	0.292	0.201
tza	0.113	0.155	0.131	0.161	0.144	0.261	0.081	0.182	0.286	0.212
uga	0.116	0.163	0.129	0.162	0.130	0.209	0.077	0.169	0.268	0.155
zmb	0.165	0.184	0.148	0.201	0.236	0.373	0.183	0.253	0.388	0.276
zwe	0.135	0.164	0.139	0.159	0.200	0.253	0.137	0.200	0.304	0.237
xec	0.146	0.169	0.172	0.191	0.240	0.314	0.172	0.211	0.298	0.302
bwa	0.145	0.282	0.251	0.308	0.476	0.493	0.449	0.408	0.474	0.409
nam	0.146	0.263	0.215	0.268	0.431	0.509	0.370	0.367	0.520	0.336
zaf	0.091	0.303	0.242	0.297	0.449	0.517	0.407	0.408	0.474	0.385
xsc	0.157	0.205	0.181	0.204	0.298	0.363	0.243	0.261	0.381	0.295
xtw	0.017	0.559	0.486	0.561	0.674	0.564	0.649	0.601	0.674	0.519